Feb. 14, 1933. C. V. RICHEY 1,897,533

TIME CONTROL SYSTEM FOR TELEPHONES

Filed Feb. 21, 1931

Fig. 1.

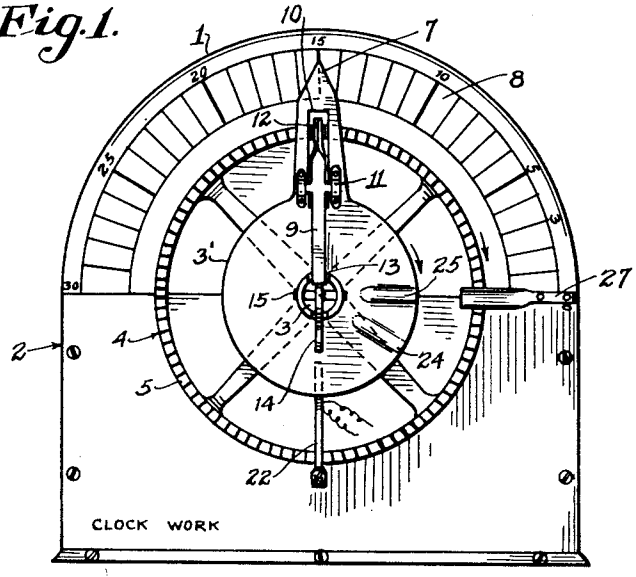


Fig. 2.

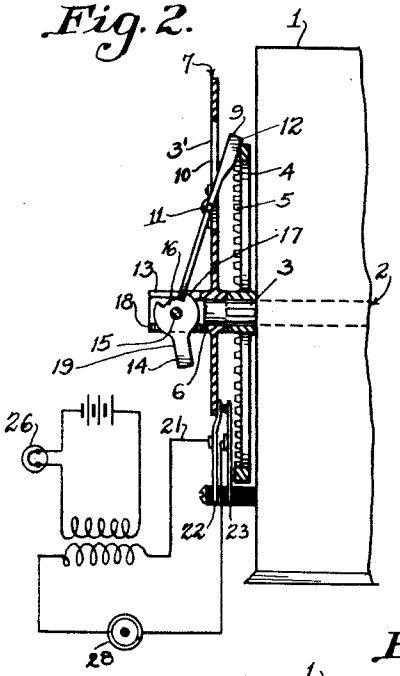


Fig. 3.

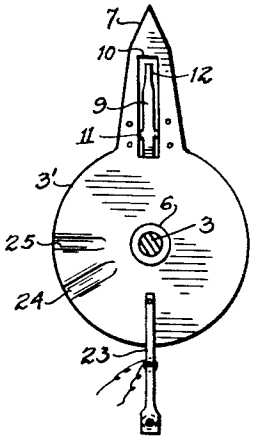


Fig. 5.

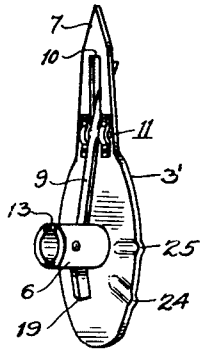
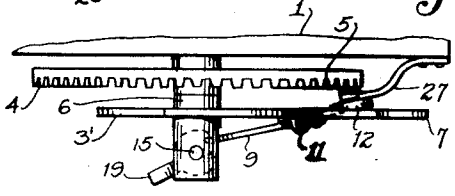


Fig. 4.



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UNITED STATES PATENT OFFICE

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TIME CONTROL SYSTEM FOR TELEPHONES

Application filed February 21, 1931. Serial No. 517,623.

This invention relates to telephone systems, and has for its general object the provision of means for metering the duration of long distance telephone conversation, and automatically terminating the transmission at the conclusion of the period for which said means is set, subject however, at the will of the operator, to be reset for another period without interruption of the conversation.

The invention is designed to correct a present abuse of the telephone service which results in considerable financial loss to the telephone companies. The maker of a long distance or toll call from a public booth frequently over-talks the time period for which he has paid and either through intent or inadvertence, he leaves the booth without having paid for the over-time conversation. Those who intentionally so defraud the telephone company have learned the trick of leaving the receiver off the hook after they have finished the over-time conversation, so that they are able to leave the vicinity of the booth before the operator succeeds in attracting the attention of the clerk, for example, in the store in which the booth may be located.

The present invention proposes the provision of a normally closed time-controlled switch in series with the talking circuit and in circuit relation to the operator's signal, with setting means acting as an intermediary between the time switch and clock work, permitting the operator to place the setting means in a position corresponding to the beginning of a conversation period for which a caller has paid and to couple it to the clock work whereby it executes a timed return to its initial position of repose. Just before reaching its final return position, the intermediary element actuates the switch to momentarily open the talking circuit and simultaneousy fluctuate the operator's signal, giving the operator the opportunity to request the deposit of another coin and appraising the caller that the time for which he has already paid is nearly up. If further money is deposited, the operator resets the device for a new talking period without interrupting the conversation. If no further toll is paid the operator does nothing and when the intermediary element gets back to its initial position the talking line is permanently opened cutting off further conversation.

Other objects of the invention will appear as the following description of a preferred and practical embodiment thereof proceeds.

In the drawing in which the same characters of reference are used to designate identical parts:

Figure 1 is a front view of apparatus illustrating the principles of the invention;

Figure 2 is a side elevation of the time-controlled switch;

Figure 3 is a front view of the setting mechanism;

Figure 4 is a fragmentary plan of the device at the end of its operation; and

Figure 5 is a detail in perspective of the setting means.

Referring now in detail to the several figures, the numeral 1 represents a casing in which is housed a clock work 2 or its equivalent, and a shaft 3 extending therefrom and operating synchronously with said clock work. A gear wheel 4 is fixed to said shaft having gear teeth 5 arranged on the forward face adjacent its periphery. Setting means is provided comprising a disk 3′ frictionally mounted on said shaft by means of a hub 6 so as to be manually rotatable relative to said shaft. Said setting means includes an index 7 which operates in adjacency to an arcuate scale 8 suitably secured adjacent the front of said casing and close to the plane of rotation of said index. The scale is preferably divided into minute and five minute scale intervals.

The setting means while normally free from the clock work, may be coupled thereto by means of a pawl 9 positioned in a slot 10 in the setting means and being pivotally mounted at an intermediate point as indicated at 11 so that the outer end may swing toward or away from the teeth 5 of the gear wheel 4. The pawl is preferably provided with a spring 12 which makes engagement between said gear teeth.

The shaft 3 terminates within the hub 6, the outer overhanging end of which is vertically slotted as shown at 13 to provide space

for the play of an actuating element 14 which is pivotally mounted on an axis 15 extending transversely of said hub. The actuating element has a depression 16 flanked by shoulders 17 and 18 in which depression the lower end of the pawl 9 rests. When the actuating element is rocked in one direction by means of the handle 19, the shoulder 17 strikes the side of the pawl 9 and swings it into a position in which the spring 12 engages between the gear teeth. This latches the setting means in operative relation to the clock work. When the handle 19 is reversely actuated so as to cause the shoulder 18 to contact with the opposite face of the pawl 9, the latter is swung so as to bring the spring 12 out of the path of the gear teeth thus disconnecting the setting means from the clock work.

Normally closed switch 20 is housed within the casing and as will be observed in Figure 2, it is in series with the talking circuit 21 including the transmitter 28. Said switch is exemplified by two spring contacts 22 and 23, normally biased so as to open when under strain, but kept closed by the engagement of the contact 22 with the disk 3′ of the setting means.

Said disk is formed with two depressions 24 and 25. The depression 24 is so positioned with respect to the switch contact 22 that when the setting means is approaching its final position, the contact 22 will spring into the depression 24 and momentarily open the talking circuit, at the same time causing the operator visual signal 26 to fluctuate. The depression 25 is so located relative to the switch that when the setting means has assumed its final position as shown in Figure 1, the spring contact 22 springs into the depression 25 opening the switch and permanently cutting off further conversation.

In order to automatically disconnect the setting means from the gear wheel 4 when the setting means has attained its final position, a lifting spring 27 or its equivalent is provided on the casing 1, or on any other suitable fixed support, which lifting spring extends beneath the spring 12 and raises it out of engagement with the gear teeth.

In operating the system, upon the party making the call having deposited the initial amount called for, the operator flips the handle 19 so as to move the pawl 9 into disengaged position, and then turns the setting device until the index points to the number of minutes for which the calling party has paid. The operator then moves the handle 19 to swing the pawl into engagement with the gear wheel 4 which is continuously rotated by the clock work.

When the setting device has moved to set position the switch contacts 22 and 23 which were open are closed, placing the talking circuit in operative condition. When the setting device has moved almost to its return position under the urge of the clock work, the switch contact 22 falls into the depression 24, giving the momentary interruption to the conversation and the simultaneous flickering of the operator's visual signal. The operator at once calls for another coin. If the coin is not deposited, the index moves to its final position in which the switch contacts 22 and 23 are broken by the falling of the switch contact 22 into the depression 25. If the additional coin is deposited, the operator merely flips the handle 19 so as to move the pawl to release position and restores the setting device to the beginning of another talking period, re-engaging it with the clock work whereupon the operation previously described is repeated.

It is to be understood that if desired a single master clock work may operate a shaft on which a number of the switch controlling mechanisms are located, in front of a number of telephone operators.

While I have in the above described what I believe to be a preferred and practical form of the invention, it is to be understood that the specific details as shown are merely exemplary and not to be considered limitative upon the scope of the invention.

What I claim is:

1. Duration meter for telephone conversations comprising a switch in the talking circuit, a timing device, a setting device movable relative to said timing device from a definite initial position, said setting device including means for connecting it with said timing device at any position away from its initial position, for returning it to its initial position thereby, said setting device including means for maintaining said switch open when in its initial position and closed while substantially in positions displaced from said initial position.

2. Duration meter for telephone conversations comprising a switch in the talking circuit, a timing device, a setting device movable relative to said timing device from a definite initial position, said setting device including means for connecting it with said timing device at any position away from its initial position for returning it to said initial position, said setting device including means for holding said switch closed while substantially in positions displaced from said initial position and for sequentially momentarily opening said switch near the return limit of said setting device, and permanently opening it at said return limit.

3. Duration meter for telephone conversations comprising a switch in a talking circuit, a constantly rotating timing device, setting means angularly displaceable, for setting, from a common starting and stopping point in a direction contrary to the direction of rotation of said timing means, means carried by said setting means for connecting said set-

ting means with said rotating timing means at any displacement position of said setting means for returning the latter to its starting position through the power of said timing means, said setting means being provided with means for holding said switch closed substantially for the duration of its displacement and permitting it to open at the common starting and stopping point, and momentarily at a point slightly in advance of said starting and stopping point.

4. Duration meter for telephone conversations comprising a switch in the talking circuit, a timing device, a setting device, movable relative to said timing device from a definite initial position, means for connecting said setting device with said timing device at any position of displacement of said setting device for effecting the return of said setting device to said initial position under power of said timing device, said connecting means including a gear movable with said timing device, and a pawl carried by said setting device engageable at will with said gear in different angular positions of said setting device, the latter device including means for holding said switch closed for substantially the duration of its displacement, and for sequentially momentarily opening said switch near the return end of said setting device and permanently opening it at said return limit.

5. Duration meter for telephone conversations comprising a switch in the talking circuit, a timing device, including a continuously rotating shaft, a setting device freely rotatable on said shaft and movable relative to said timing device from a definite initial position to a definite displacement position bearing a ratio to the duration of the conversation, means carried by said setting device and engageable at will with said timing device for effecting the return of said setting device from its displacement position to its initial position under power of said timing device, said means including a gear on said shaft forming part of said timing device, and a pawl on said setting device engageable with said gear, said setting device including means for maintaining said switch closed for substantially the duration of displacement of said setting device, and for sequentially momentarily opening said switch near the return limit of said setting device, and permanently opening it at said return limit.

In testimony whereof I affix my signature.

CHARLES V. RICHEY.